

AVIATION

The Oldest American Aeronautical Magazine

APRIL 18, 1927

Issued Weekly

PRICE 15 CENTS



Naval Flight Operations off Panama

VOLUME
XXII

SPECIAL FEATURES

NUMBER
16

OIL ENGINES FOR AIRCRAFT
THE IESMAN DURALUMIN RIVET
ARE AVIATION RECORDS WORTH WHILE?

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
250 W. 57TH ST., NEW YORK

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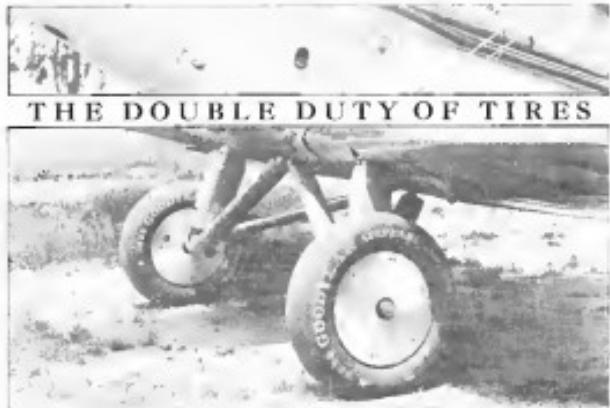
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Cable Address—AEROGARD
Publication Office—HIGHLAND, N. Y.

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Vol. XXII APRIL 18, 1927 No. 16

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Subscription price, Four dollars per year. Canadian Air delivery, Postage paid. Air delivery, postage extra. Extra for foreign countries, \$1.00 extra. Single copies, 25 cents. Address all correspondence to publisher at 250 West 57th Street, New York City.

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With the Editor

The long flight of the Pan American fliers is nearly finished and they will soon be back at their base. The Pan-American flight of Commandant de Freitas, while temporarily halted will soon be resumed and Americans will have a glimpse of the Indians after a long distance flight down. With that glimpse he too will be gone and his keen sense of humor and jester-like qualities often and delicate stretches of tact will have become with the Pan American flight a part of history.

Our Spring is here, and with it come rumors and announcements of new flights to be undertaken in the early Spring and Summer. Already two French pilots who had hoped to make separate dashes for the Bremen-Greifswald prize have joined forces and expect to make the Atlantic flight together, in order to speed up the time of departure. Two Americans have announced definite plans for a sweep of the ocean by plane and two others have joined the lot, although not specifically stating their arrangements. The Summer flying game promises to be an interesting, from the long-distance flight standpoint, as that of the Winter and early Spring.

FAIRCHILD CABIN MONOPLANE

SINCE 1920 Fairchild has been operating and maintaining for planes for its aerial photographic work. In this seventeen year period almost every make of commercial plane has been used, through varying operating conditions and areas. From the specialized skins and tools of Fairchild Aviation Ltd., to the operations around Tampico of the Compania Mexicana de Aviacion, a range of operating experience has been acquired, which would be hard to duplicate.

In August, 1925, Fairchild decided to begin his own operating experience, and manufacture commercial airplanes. A modern daylight factory was acquired and completely equipped at Farmingdale, Long Island, and an experienced engineering staff organized. Repeated wind tunnel tests were made at New York University to insure the best aerodynamic efficiency of the plane. The streamlining was most carefully made and scrutinized, so there could be no question of power safety factors. And before any parts were released to the factory, it was approved by Fairchild pilots to be certain it would be easy to service, and practical under operating conditions. The Fairchild Monoplane was tested and successfully flown through the Ford Tower, maintaining the highest average speed of any 0250 job. A "Whirlwind" motor was then installed and the plane retested.

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FAIRCHILD AIRPLANE MFG. CORPORATION
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Division of

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765

In stable under all conditions of load, handles easily and at the same time easily. When stalled, the nose drops with tendency to fall off the ground. Piloting experience taught us that part of the art of flying was due to wise and solid, so we put the pilot inside, and yet managed to give him a range of vision, that is found in but few open cockpit jobs.

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Our policy is quality first, production later. For this reason it has been impossible to increase production to meet the demand. The first plane goes to a private owner in Denver, two and three to the Curtis Flying Service, four to the Department of Commerce, five and six, on fins, to Canada, seven to Mead, eight and nine for our own demonstrators. Production will later be increased to two a week.

Back of the plane, the engineering, the manufacturing and the testing stands the Fairchild Aviation Corporation, an organization of 150 men and a paid-in capital of \$100,000, with seven years' successful growth in the aviation industry. Its name and reputation assure you of workmanship, service and value.

Vol. XXII

APRIL 18, 1927

No. 16

The Oldest American Aeronautical Magazine

The New York-Chicago Air Mail Award

THE AFTERMATH of the awarding of the contract

for the air mail between New York and Chicago, continues to be a matter of public interest owing to the fact that the lowest bidder did not get the contract. After the Western section of the trans continental mail service as well as all other air mail routes had been awarded to the lowest bidder, the awards were consolidated and the decision accepted as final. With the New York-Chicago route, there has been more competition and more difficulties have been involved. One of the results has been the creation of a certain amount of ill feeling that has had a very unfortunate effect on the postal mail.

When the bids were opened, there was a great interest in the names of the Air Mail pilots who had attempted to provide for their own future by interesting some Cleveland capitalists in forming a new company to carry mail by air from the Atlantic to the city of Los Angeles. These men who were engaged in this route had done a good deal of work and it was their opinion that their plan should have been generally received with sympathetic interest. When the public learned that they were negotiating with the intention of participating in the formation of an air transport company, it was natural that from a sentimental viewpoint their action was viewed as a logical outcome of the prospect of a disaffection of these pilots with the Air Mail. Many hoped that they would be succeeded by the low bidder.

When the bids were opened for the second time, the North American Airways, the company at which the pilots were interested, was the low bidder by one cent a pound, if the proposal of one company to carry all the mail at thirty-five cents a pound is disregarded. After the decision from the Comptroller General regarding the awarding of the route to the lowest bidder almost immediately, it was believed that only the most compelling reasons would induce Postmaster General Scott to award the low bid and sacrifice his right to award the contract to the bidder who in the opinion of the Post Office authorities was best qualified to carry the mail.

The Postmaster General made a good bargain for the postal service by breaking the price per pound for this route down from \$1.95 to \$1.25 by calling for new bids. At a time when economy is such a popular term in Washington, the results of the competitive bidding may be regarded as a triumph of the present policy of the Government. It will take a year or two to determine whether this policy, applied to the carrying of air mail, is wise or is to involve the successful bidders in great losses.

In making the choice between the two bids, the Post-

master General had a very difficult problem to solve, with only a cent's difference for each pound carried, the qualifications of the two lowest bidders to render the best service became more important than the gain or loss to the Government from the awarding of the contract. Under the Kelly Bill, and a Comptroller General's decision, Postmaster General Scott is allowed to use his discretion in making awards, but has to give reasons, in case he does not choose to let the contract to the lowest bidder. The fact that the National Air Transport is largely financed; that it had been organized and is active operation for over a year; and it had had experience in operating an air line successfully and that it had made a creditable record of operations were undoubtedly the controlling factors in leading to the awarding of the contract to the N. A. T.

The decision might have been a difficult one to make and as the Postmaster General is bound by his oath to protect the interests of the Government, he had to consider the letting of this long route strictly from a service standpoint. Doubtless there will be the usual investigation of the reasons that prompted the awarding of the contract to the third highest bidder, but after all the facts are known, it will probably be found that the Postmaster General acted with usual caution and integrity.

De Pinedo's Regrettable Misfortune

THE DESTRUCTION of Cesarino de Pinedo's

plane will bring a feeling of sympathy from all those who have sporting blood in their veins. Hailing from the Mediterranean, down the Atlantic Coast, across the South Atlantic, over the jungles of the Amazon River, and, now, by repeat stages, to the United States in the course of many of his flights that his plane should have been burned out during a landing of a small boy. The boy was flying with his pilot but we cannot help feeling that having performed so splendidly, the Berlin 8.88 deserved a better fate. De Pinedo's flight has been truly a remarkable one. There are few precedents for the distance which he has traveled and for the regularity with which he has proceeded. Italy's long distance flight champion is certainly worthy of the praise which his countrymen have showered upon him. His performances have watched with interest and admiration by the rest of the World and has brought new prestige to Italy. It is certainly to be hoped that de Pinedo will obtain a new plane from Italy and continue the flight which he so ably demonstrated the reliability and air transport possibilities of the modern flying boat.

Aircraft Display Committees Elected

Committees and Delegates to Pan-American Conferences Nominated.

THIS is the first organization meeting to be held in Washington, D. C., for All American Aircraft Shows, took place April 6, at which time the members of the various committees before Washington and from outside cities, met and outlined plans and duties. The Show will be immediately opened as Monday, May 1, and close Friday, May 11. It was originally intended to open the Show on April 9, but it has been decided to extend it one day. An appeal was made by the chairman of the Exhibitors Committee, Mr. George E. Johnson, to the Pro-American Committee, for their interest and assistance in the Program. Committees on Finance and Patronage, Groups 5 and 6, and the Flying Field, affecting approximately 25,000 sq. ft. of space, will be used for planes.

C. C. Petersen is managing director of the Show, sponsored by the Association of Commerce at Commerce, Porter 14-0000, president of the National Association Association, as acting as chairman and Edward W. Gishard is executive secretary for the Washington Committee, which will be in special charge of flying at the Display. The Show will function through the following committees, whose members were present at the organization meeting:

FLIGHT COMMITTEE

新編增補行藏錄卷之三

C. G. Johnson, Capt. Robert F. Price, Adjunct Chap. Capt. General, Army Chaplains, Army Chaplains Dept., 1201 B St., Suite 200, Washington, Major Harry E. Barnes, Capt. 8th Army Chaplain, Headquarters, Eighth Army, D. C. C. O. Headquarters, C. W. 1001 1st St. S. E., Washington, D. C. 20330, Captain John W. Conner, Chaplain, U. S. Marine Corps, 1400 K St. N.W., Washington, D. C. 20380, Captain J. L. Johnson, Chaplain, U. S. Air Force, Headquarters, U. S. Air Force Chaplain Service, Washington, D. C. 20330, General Chaplain, 1401 K St. S. E., Washington, D. C. 20330.

WHAT DO NEW COMMUNITIES

Sgt. Major B. Wright Army and Navy Journal, Los Angeles, Calif. L. M. W. C. Corp. Test Station U.S. Air Service, San Diego, Calif. (Chairman of Com. I, First F. B. I. Meeting Nov. 1920) Major C. S. Jones, Jr., Director, Bureau of Aircraft, Dept. of Commerce, Dept. of War, Washington, D. C. Major, Department of Justice, Washington, D. C. Major, Department of War, Bureau of Artillery, Washington, D. C. Major, Department of War, Bureau of Air Corps, Washington.

TRANSPORTATION COMMITTEE

Henry D. Wright, 1941; H. Wright & W. Good, *Object*, 1941. One modified version, listing 54 top General Electric and 12 smaller U.S.A. & U.S. Export Distributors. Standard Chamber of Commerce of U. S. A., typed D. Johnson, Sales Office, Department of Commerce, number of 100 copies.

One day during the Display will be set aside for the exhibition of reduced printsheets. The Secretary of Commerce will invite these organizations to be present to witness demonstrations of part of the post modern printsystems as taken in present transportation problems by fitting into railroad systems through computer.

bined train-and-plane service. This plan embodies a trunk line, through which operates all air mail service or division, will reduce its trunk mileage or speed up its service, as operating expenses are measured in competitive territory without leaving out rights-of-way.

They prominent business men have been invited to fly their privately-owned planes to the Show. It is planned to give the afternoon of Thursday, May 5, to delegates to the Chamber of Commerce of the United States, at whom it is anticipated more than 2,000 will be in attendance at their convention. A special show will be staged for that afternoon.

In conjunction with the Pan-American Commercial Conference the Inter-American Commission on Commercial Affairs will be held at Washington, as reported in *Antarctica* last week, beginning May 2 and concluding May 5. The Commission will meet in association with a resolution of the General Assembly of the Pan-American Union and will consist of representatives of twenty-five American republics. The terms of the resolution give the purpose of the Conference to consider the development and regulation of commercial affairs within the republics of the Americas and to

While representation of the Commission will be limited to the officially appointed delegates of the Governments of the American Republics, an opportunity will be given to the various delegations to meet in the presence of the members of the Commission, the first to be held on Tuesday afternoon, May 3, and the second on Wednesday morning, May 4. To these sessions, the National Aerospace Association and the Associated Chamber of Commerce have been invited to appoint representatives. The Aviation Branch of the Army and the Aeromarine Branch of the Navy and the Bureau of Commerce, the National Advisory Board, and the Weather Bureau will also be asked to send a representative. The main purpose of these several meetings will be to enable the Latin American delegations to meet the aviation experts of the United States and to benefit from the experience of these experts.

The following organizations have been designated as delegates from the Association Chamber of Commerce:

Col. Paul Henderson, president, Aerospace Chamber of Commerce of America, and general manager, National Air Transport, Inc., Chicago, Ill.

Major Gen. John F. O'Byrne, president, Colonial Air Transport, New York City
Harold F. Pratt, president, Prater Aviation, Inc.,
Tampa, Fla.

The program for these sessions is now being formulated. Major George H. Baughman has been asked to act as the president and father of the continental session. Major Baughman is the representative of the War Department, the Commandant of the Cavalry School, and a representative of the American Cavalry Branch of the Department of Commerce has been invited to make an address on regulating the operation of commercial aviation. The greater part of the sessions will be devoted to discussion. It is thought that the Committee will adjourn in session for two weeks, at least.

To the Third Pan-American Commercial Conference the
Aeronautical Chamber of Commerce has elected the following
delegates:

Cook, Franklin F. D. W. Russell, D. M. Kays, Chas. L. Johnson, T. P. Brewster, Major Gen., U.S.A. F. O'Brien, Indianapolis, Ind. G. Donnan, Mayor, Louisville, Kentucky, H. B. S. Gandy, F. E. Johnson, Indianapolis, Ind., Wm. J. McMillan, C. H. Peacock, Chas. F. Collier, Col. Fred Flanders, C. D. Shultz, General S. Murphy, Director, Douglas.



The French Second Yacht Committee has been formed to which the following persons have agreed to contribute:

Are Aviation Records Worth While?

Experience Shows that World Aeronautical Records Foster Technical Development, Increase International Prestige

By W. L. LePMCE

THIS is the day in which the antagonism of new countries seems to have been looked upon as a pure sport up to now. Disputes about frontiers and autonomy rights are not record performances as considered relative to a business. Otherwise, both in this country and abroad. Whether there has or has not been up to the present international relations on World markets is unimportant, for the very high performance now necessary in order to break these ranges, it becomes almost beyond the scope of private sporting enterprise.

Now let us look at the World population, gained as a result of these wars and flights, both by natural immigrations, although as small as large, but also by very extensive foreign trade for the American Industry has resulted. There has, of course, been a serious increase of foreign business, which may be directly or indirectly stimulated to the antagonism of World records by Americans' interest in the past. The Chinese 125 ranges, for example, reflect his new business standard equipment in its class in the British Royal Air Forces, no doubt gained this distinction very largely as a result of the world wide speed pro-

America's deficit in the 1926 Balfour Trophy was caused to place the general subject of World records and their value in the balance, and with the drawing away of the 1927 medal, the question of the Balfour Trophy has been omitted from it. If the setting-up of World athletic records were a purely sporting proposition, as we see it, if it were solely concerned in aspects, it would be of such vital international importance, but since record breaking has taken on the dimension of international propaganda, it deserves the attention of every interested in aviation. Rather than, then, let it pass in unnoticed obscurity on this subject, that, with my professor at conspicuously covering all the aspects of it, that these notes are set down.

As far as America is concerned, at least, the setting-up of World Health has, since the War, been almost entirely a matter of American initiative. It has been the result of a desire, at a time of international competition, while, to other ends, the cornerstone of health has been established from the standpoint of its own intrinsic value. In either case, however, one of the major results of the numerous medical delegations which have been made under American initiative, has been the more general boosting of health in the whole world, and especially among the less fortunate peoples.

that they were the only factor entering into the development of these machines.

From the standpoint of commercial aviation, speed records obviously are not the most important aspect of design, and it is not so much the record of speed as it is the record of the possibility to have the development of better speed qualities added to the improvements of commercial airplanes, for economic reasons. There is no doubt whatever that were all our very excellent mail commercial airplanes of the two and three-engine class world not have such good speed qualities, it had not been for the fact that high speed racing planes have had an influence on the design of commercial airplanes. Again, certain popular airplane manufacturers, which were not so concerned in other competitive small firms, will resist the influence of racing plane designs.

Records Stimulate Technical Growth

It is therefore, there is no question that the development, in racing speed considerations, on the part of the engineers of racing speed records, has not only provided profit with many other important contributions to the progress of aviation, than anything to be found anywhere else in the World, but it has also stimulated indirectly the development of American and aviation since the emphasis has on record breaking has constantly influenced commercial airplane design. Commercial aviation is generally considered to be the backbone upon which defense can be built up, and thus the basis for the future.

It is not difficult to find very similar arguments to prove the value of altitude records in the development of aviation in all its phases. Not are these arguments unusual, inasmuch as in all cases they are substantiated by actual fact. The development of design qualities, which enable higher maximum altitude to be obtained, has a very direct bearing upon the design of aircraft machines. The records have stimulated the production of airplanes capable of flying high out of range of anti-aircraft fire, but from other aspects also. For example, high altitude airplanes may reasonably be expected to climb very much more rapidly at normal heights and, while record breaking problems are indeed difficult for practical purposes, the application of qualities developed in the altitude records may be directly applied to the design of military aircraft.

The further development of commercial aviation, the development of high altitude qualities in design has another and extremely interesting aspect. The setting-up of altitude records has played an extremely important part in the development of aircraft superchargers for Wright engines. Not



ANOTHER FRENCH GRAND RAID—Lambertine Gouraud and Captain Georges de Roche are shown after their flight from Toulouse, on Route and Tools in a biplane KIR

only in military aviation, but in commercial aviation also, the supercharger has had possibilities. The suggestion is often made that commercial air liners of the future will pack their altitude records away, but it is very likely to take advantage of developed conditions. It has been suggested, for example, that flying East to West in the Northern hemisphere there is a very distinct favorable wind, which can be used to advantage at extreme altitudes. Whether or not large commercial air liners, operating on the main trans-ocean routes of the World will, in the future, take advantage of any such atmospheric conditions, depends on the merit to which these improved conditions have been recognized in the technical development of aerodynamics. However, as far as I shall not fail to provide for the future development of commercial aviation we must continue in the improvement of the altitude qualities of aircraft by all means possible. And in this, the competitive elements of record breaking will play an important part.

The following International Aspects—of this discussion now come to those less than 100 World records.

The setting-up of altitude records has been extremely important to French fliers, owing to so-called "Militarists,"

forty-five to seaplanes, forty-five to airplanes, five to gliders and twenty-one to helicopters. All but those which relate to seaplanes and seaplanes came beyond the scope of the dis-



The French Sisley-Spad N. (Gouaud-Girnick, 200 cu. in. water-cooled Hispano supercharger) in which Jean Gouaud set the meeting World altitude record of 6,000 m. on Aug. 29, 1926.

Kennedy Photo

noted that time held but six, has been excluded from the plotting.

The curves show very clearly the rise in the status of the United States at the beginning of 1926 until a position was reached at the beginning of 1928 when the country held almost all the World aviation records to be had and certainly had the most complete. At the same time, it is evident that American aviators were not up to speed in international prestige; nor is much about entirely of the performances which were being set up by American pilots in American airfields.

France Offers Prizes

France, too, stimulated by the modest nature of American supremacy, turned to those short distances which seemed high-standing in World importance. The year 1926 saw the initiation of what might be regarded as an organized campaign in recognition for her country's role in the World aviation records which she had then lost. So seriously, in fact, did the French Government view this matter that early in 1926, Léon Jouhaux, then Minister of State for Labor and of Public Health, announced the offer of prizes put up by the French Government amounting to no less than 650,000 francs, for French manufacturers whose planes put up new World records during the year 1926. These prizes were apportioned as follows:

(a) A prize of 100,000 francs for the constructor of the French seaplane which neared the speed record and 60,000 francs for the manufacturer of the engine employed in that airplane.

(b) The same prizes for seaplanes.

(c) A prize of 50,000 francs for the manufacturer of the seaplane which set up a distance record without refueling and a further 60,000 francs should the endurance record be broken at the same time.

The engine manufacturer was to receive 60,000 francs if the endurance record were broken.

(d) If the straight line distance record was broken one or more times, the French

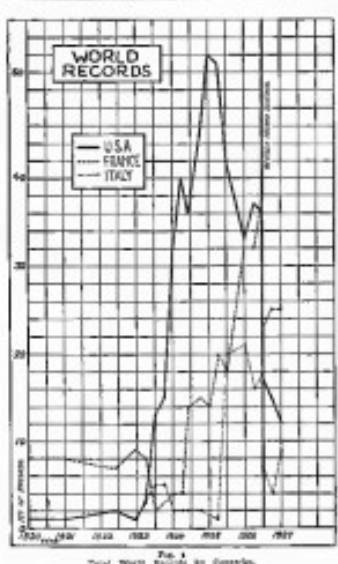


FIG. 1
Total World records by countries.

records. Furthermore, the forty-five seaplane records are steadily a majority of those which apply to seaplanes. Whether or not there is any justification in having as many as forty-five records for both seaplanes and airplanes in another question which is beyond the scope of this article, but since we are dealing here with what may be called the basic records or records which are to be considered to have had a definite place in aviation from the purely theoretical standpoint, we may reasonably consider only certain of those forty-five seaplane and airplane records.

"Basic" Records

The total number of records, for the purpose of this discussion, has, accordingly, been reduced to nine for seaplanes and eight for airplanes and these have been termed "basic" records. Record and record holder, respectively, are given—seaplane—Distance (feet), distance (straight km.), altitude, maximum speed, speed for 100 km., speed for 500 km., speed for 1,000 km., speed for 2,000 km.

Seaplanes—Distances, distance (feet), distance (straight km.), altitude, maximum speed, speed for 100 km., speed for 500 km., speed for 1,000 km.

For the purpose of following the present status and future trend of the World record situation, Fig. 2 has been plotted. It gives, from the year 1920 to 1927, a very striking idea of the rise and fall of the nation in the series of World records. In this graph, all records are included. Great Britain, which used to hold any records after 1925, and even 1926,

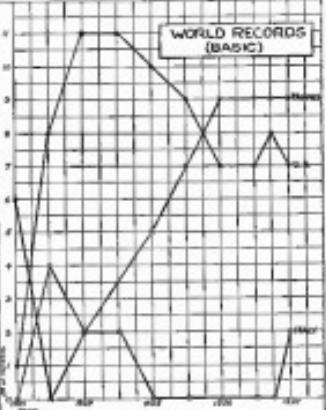


FIG. 2
"Basic" World records by countries.

on a very complete program of investigation of the conditions encountered in aircraft engines, particularly the question of fuel in small enclosed chambers of various forms, and they have also studied the effect of variations in the compression ratio on the N. S. A. C. A. Test Engine. Some of these tests have shown that, with a compression pressure of 629 lb., only one revolution is necessary to start with a cold engine, which is a decided advantage. Using a gas-operated fuel pump, a fuel range from 200 cu. in. to 1,700 cu. in. has been obtained, and the maximum test engine has also satisfactorily at speeds below 250 r.p.m.

Fuel spray and injection valve characteristics have also been studied by the National Advisory Committee and the results are now available. The work of this laboratory is a very important contribution to the development of the high speed engine, and is especially interesting in this connection because it has been undertaken by a laboratory which is directly concerned with the mission of aviation power plant problems.

Bendixen Develops Oil Engine

The Bendixen Company of England, under the direction of Alex. G. Cheshire, has produced several light-speed engines used on radars which develop about 300 hp at 750 r.p.m. The engine of 10 cu. ft. weight is 15 lb. 10 1/2 per b.h.p. It has an overhead valve, the Bendixen Company having taken some time to a point where camless methods can be adopted successfully as present in some of their designs. Mr. Cheshire places the weight of these engines in the neighborhood of 3 lb. per b.h.p. and as a recent addition before the Royal Aeroautical Society he predicted the practical utility of the oil engine for aircraft purposes.

The Bendixen type of engine probably follows the general practice which has been followed in the heavier Beardmore oil engine, that is, a cast steel multi-tube crankcase construction with sheet cylinder liners. A solid injection fuel system is applied after a method patented by the designer, in which the fuel column is kept in constant fluctuation by a constant stroke plunger with delivery to the jets controlled



The air compressor on the Maybach-Schnell Direct engine by a rapidly moving check valve on the supply side of the fuel pump.

The Altona oil engine has received some attention from our Army Department, which seems to be the branch of our lighting air force taking the most interest in aviation oil engines. Several models of the Altona engine have been built and it has been supplied with considerable success to heavy motor trucks.

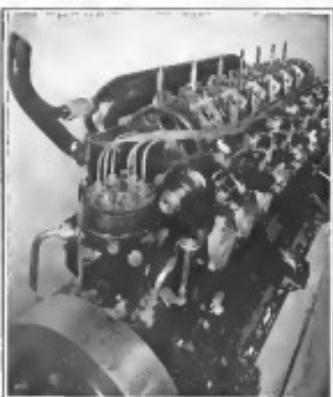
An experimental aero-type Altona engine was tested by the Army Department about 1 year ago with such promising results that it is understood that a further refinement of the same engine is being prepared. The existing test engine was a two-cylinder unit, 10 cu. ft. weight, built of mild steel and aluminum alloy, developing 65 b.h.p. at 1,000 r.p.m. The cylinder bore and stroke were obtained from the 10 cu. ft. engine, but has been reduced to 18 in. and the fuel intake pressure is 15 lb. per cu. in.

Fuel management of the exhaust gases is controlled by placing an exhaust valve in a location outside of the exhaust ports, while pressure is built up inside the compression chamber. The heat of the exhaust gases has been effectively utilized. A large diameter sheet steel air compressor is mounted on the side of the engine with a return valve immediately above it, and two intake valves operated by an overhead camshaft are located in the aluminum cylinder head. A compound fuel pump with a variable timing control is fitted and a speed range of from 700 r.p.m. to 3,220 r.p.m. has been obtained.

The Maybach Type

The Maybach-Schnell high-speed diesel engine is another very interesting development which has been undertaken by the builders of the engines used in the Repubblica. This engine achieves very steady in the design positive current in the lower temperature half-life by the same manufacturer and is a four-cylinder, air injection, oil cylinder type, developing 350 b.h.p. at 2,000 r.p.m.

The weight of the tank is slightly over 17 lb. per b.h.p. but as the cylinders and crankcase are cast of grey iron it would probably be possible to reduce the weight considerably by

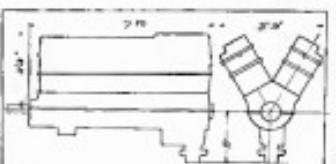


An end view of the Maybach-Schnell Direct showing the oil pump and distributing gear box.

Company, by Bergmeier, the Italian designer, and by Dorni, but these engines are presently but look types and are for this reason unsuited for consideration for aviation services.

Concerning the development of the Schnell engine, one of our engineers by Elmer A. Sperry, an employee of the Sperry Company, and his method of attack differs considerably from the work done by some of the other designers. Mr. Sperry has largely confined his efforts to the problems of an engine which will possess the use of a much higher engine efficiency which is uniformly used. The higher engine was completely described in a recent issue of AVIATION.

Recently, the Sperry Company has developed a production type of light-weight oil engine which has been suitable for use as mobile equipment such as motorcars, trucks and dredges. Among the road vehicles in this field have been the Alton-Imperial Engine Company, the Canadian Engine Company, the H.H. Diesel Engine Company and the Farn Engine Company. Some very interesting work in light weight construction has also been done by H. P. Shapley



A section of a aero-type supercharged aero-type oil engine by Sperry.

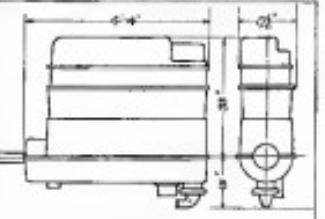
shutting arm engine. The engine is built on a light weight crankcase, and a distributor is situated in the front end of the crankcase to eliminate vibration at critical speeds. The intake and exhaust valves are located in caps in the cylinder heads and are driven through rocker arms from a single overhead camshaft.

The intake valves are located on the side of each cylinder block and are controlled by the intake manifold. These valves can be removed for inspection and ease the maintenance and facilitate the service work on a constant cylinder. A raised shield for the variable spray nozzle is located on the side of the engine over the fuel valves and the design not only permits a very low fuel consumption but also makes the speed of the engine variable through an unusually wide range. A variable intake air valve is located at the end of the engine and is also fitted with radio linkage. The intake air is fed after passing through a distributor which forces the admission into the cylinders and each cylinder is fitted with an automatic starting valve which closes instantly at the moment of combustion.

The Maybach engine in its present form is well adapted to use on sea and land aeroplanes and there was some talk of using it on dirigibles, but the engine is not yet built. In fact, Mr. De Becker has been experimenting with the use of gasoline fuel for the newest Zeppelins, 16 looks as if this project had been deferred.

A high speed light weight oil engine built after Sperry design is being produced by the English Midland Railways and although no details are as yet available in regard to this engine, it is believed that the design and basic principles will be used in the heavier Beardmore engines. The Midland Railways engine when built of aluminum weighs 26 lb. per b.h.p. and develops 66 b.h.p. at 100 cu. in. which performance is comparable to some of the American types of portable gasoline which are used on touring equipment.

Work on this field has also been done by the Panzer



of the Panzer Gas Engine Company, although his efforts have been mostly confined to the larger units.

Since a brief history of the progress made to date shows that a considerable advance has been made in defining the problems which must be solved in developing the experimental techniques for furthering their solution, and in supporting the support of the industry in the pursuit of these objectives, it is to be hoped that the British influence of the new and more exacting standards will be a constructive factor in gradually bringing forth a type of aviation power plant, which, even at this stage of its development, gives promise of being an important factor both in the extension of our air transportation facilities.

Dopes and Detonation

Experiments were recently carried on in the Air Ministry laboratory at the Imperial College of Science, London, to determine the nature of detonation in engines using liquid fuel, with special reference to the detonation aspect of the problem.

The experiments included an experimental and theoretical study of low temperature detonation, and the use of low temperatures to prevent detonation, and observed detonation. It was found that detonation in an engine using liquid fuel is due to the formation of organic peroxides, which becomes concentrated in the nuclear drops during compression and ignites them simultaneously when the detonation temperature of the peroxide is reached.

The results of these experiments show that the kinetics of organic peroxides might be used to the discovery of more useful dopes than are known at present or perhaps to new methods of preventing detonation.

Airways Aerological Work

How the Weather Bureau Stations Function to Provide Air Mail Pilots with Accurate Weather Information.

By C. G. ANDRIUS,
Meteorologist in Charge, Weather Bureau Station,
Holley Field, New Brunswick, N. J.

FILTERS ON the numerous rivers of this country are now witness to a new enterprise of the Wissler Company.

Show me the vital needs of the airman who has survived war
I have had the arduous burden of the Weather Bureau,
which has for many years been held back from this important
expansion because of lack of financial encouragement.
The many brilliant flights, etc., have all sought and received
aid and help from the Weather Bureau. Until recently, the
general uncertainty concerning the real future of air transport
prevented the possession of planes to make air traffic
as interesting as oceanic aeronautics flights had been earlier.
The recent war news has demonstrated that their operation,
now having a genuine public utility, for what is due to be
provided a regular and courageous system of weather
forecasts.

There is a great difference between the boldness of the species of woodpecker birds and the diffidence of water-fowl produced through similar trials. In the difference, principally, of attitude in this bird occurs the best of suitable conditions for the flight; an extreme objective, and of obtaining a few hundred yards on a considerable daily journey, around, over or in spite of whatever weather presents itself.

Forecasting The Paramount Need

The problems, neither simple nor old, have necessitated growth along several lines, which are being expanded and developed rapidly under the guidance of the very men who dry. What are these novel lines? They embrace, presently, the second administration of the development of lymphocytes or

Ingerous weather on the airways, namely, the collision and dissemination of dust comprising atmospheric conditions in the first twenty thousand feet of altitude over the strength of navigational aids and landing facilities are improved, the

To illustrate the application of the term "weather service," it is not necessary to see how it is applied to the country which is distinguished as having the worst weather in the country—by common consent, the New York-Cleveland division of the U. S. Weather Mail Train Commanded by General George F. Sheppard, who has charge of the Atlantic Coast, the Allegheny Mountains, and the Great Lakes, and from the fact that all storm roads lead to the St. Lawrence valley, and the majority scores road lies already. Between the two extremes of the country there is no such thing as the weather service that covers four states. Unfortunately, little has been done to the service of the places who regularly have these adverse conditions, from them and from those who deal with them, there have been learned what are the precise

and weather factors in aerial navigation. Of the meteorological conditions, fog and low ceiling are perhaps most responsible for flying accidents of the greatest magnitude, and are often associated with a heavy rain.

When flying at night, visibility and low ceiling are usually more serious than in flying over snow-covered land areas as suggested in *Investigation*. It apparently limits direct observation of other conditions above the ground, although it cannot prevent the virtues of being on cleanness of flying weather which can be observed and reported by the unassisted observer without instrumental equipment. The collecting of such in-

April 18, 1997

points, their study and interpretation, and how the predicting of their onset and duration are parts of the process of examining the outside of fog. The "washing" and drying out of fogs of dense and voluminous character, although doneable in the laboratory, are not yet practical on the flying field.

Upper Air Movements

monograph of the conditions of the stratosphere and the sources of energy available for the development of the upper air, and in these strong stormy conditions the many of the aspects that must be kept under surveillance. To be sure of their progress it is to be observed of these changes. Most of the conditions which, when combined, form approach weather as far trouble as not individually possess great danger; the cyclonic setting, the rain, the snow which, and the low visibility must unite to conquer the terrain, so that each one deserves a separate chapter. The first of these will be the cyclone at 10,000 feet, which occurs about 1 in 100 in average, and the West Northwest, as it frequently does in winter, when on the surface and up to 0.000 ft. the air is drifting slowly toward the West or Northwest. In its outward, although

demands adoption of a low altitude; by its contrast, efficiency demands a high altitude. To fly site better weather is frequently quite feasible when the start must be made in weather which would otherwise be impossible. So the choice of best weather is the privilege of the weatherman as by this time he has had the benefit of some 100 hours of flying experience in various types of weather either in the form of the way or front regions along it. The remedy is at once recognized and prevention may be said to be in more positive, than a hurried postscript when we deal with the stresses of violent weather.

During the cold season of the year, the accumulation of ice on the various exposed edges of an airplane introduces a weather collector which is known because it impels precipitation, condensation, convection and circulation methods of precipitation. During the winter months, snow accumulates on the ground, and they can be melted by heated air. When certain conditions of temperature, humidity and wind are right, the surface repeats.

The blizzard, thunderstorms, lightning, tornado and gale often happen to flight. These are treated in both section and chapter, along with many that make most interesting. The lowering ceiling and thickening fog, the damage rate and the shifting wind are discussed in response to the possibility of the ideal flying conditions. But weathermen are true their whereabouts with astonishing accuracy.

In actual practice the stratosphere service operates to maintain a windflow reporting system and functions as a clearing house for the exchange of reports from pilots and the interpretations of various weather from the reports, the general synopses and the meteorological theories which are considered as sound.

On the New York-Cleveland line, the reports are gathered from a network of stations along the airway at intervals of hundred miles or less and comprise a detailed description of the state of the weather and sky, the height of the ceiling, the extent of horizontal visibility, the strength and form of winds, the amount of precipitation and the temperature reading. They are exchanged over the airway through the medium of the biplane and a radiotelegraph. To size up the present weather situation a series of these reports is taken at 8 o'clock, noonday and evening. To present a true picture of the weather conditions along the airway, additional reports from other stations are collected. At 8 o'clock additional reports from other stations are collected at the departure and arrival points and the strength and form of the airway during the hour before, the globe starts out.

The reports are made at frequent intervals when a pilot holds up because of unfavorable weather and the cause of suspending conditions is, thus, promptly detected. These reports are tabulated for the pilot to study, and the pilot then has an opportunity of comparing with the meteorologist as to the moves and tendencies exhibited by the reported stations and of securing his interpretation of those conditions in the light of the latest weather maps, previous similar

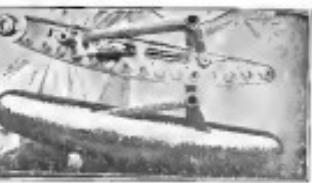
It may be an unfortunate fact that flights must be postponed, and when the question arises as to how long this delay will be, the question and the question as to the maximum admissible time on the runway from its origin or end can be referred to in the weather map.

Upper Air Soundings

The knowledge of the conditions of the atmosphere and the occurrence of cloud ceilings is accomplished at special sets of survey traffic where suitable equipment and personnel are available. Liquid balloons, filled with hydrogen, are sent up in the open air, and the first flight by them is used to determine the dimensions and form of the clouds, the altitude at which the clouds are floating as a whole, and the general structure of the atmosphere over long distances. These aspects are studied along the survey road and the locus upon which a pilot is able to decide the most favourable altitude at which to fly, as well as providing casting-height data which is otherwise difficult to estimate.

Another feature of metacardiac curves is the fact of determining the approximate curves to be applied as a method's ultimate for change in the harmonics as presented as the process proceeds as its course. But again, this situation has been paid to this conversion in many ways, but its importance can be represented by considering the following fact: the area of longitudinal harmonics has almost always been considered as the fundamental function in the law. As the point usually mentioned in this connection is the frequency of the fundamental function, the following frequency, low setting and relatively variable may serve as the usual self-elimination of its stability, and if he has used as allowance for the conversion which the reduced pressure happens on the cylinder he may come adequately over to working. The conversion of the law of the basis of expected harmonics is the foundation of the law of the basis of working.

The Vinay Roller Skirt



Entom. Form. Americalis, of Paris, well known for the species which are found especially in France, has published a figure, now lost, of a color still far cryingly similar to certain wood-borers which are said to occur in similar localities as the ones I have described and to share also some possibility of confusion. The one to be found in the area under review wears over a red or the ground. The one to be found in another rather broad region on cedar-boughs and hydraulic

Wilkins Starts for Point Barrow

On March 28 the three planes which are taking part in the Dettah to Point Barrow flight, started out from Fairbanks for Point Barrow to start the attempt to find land in the unexplored portions of the Polar regions.

The first plane, which is a Super-De Havilland, to take off on the 28th was obtained from the Fairbanks Airplane Corporation, while the Alaskan, one of the three planes of the expedition, took its landing stick during a test flight. The amateur plane carried Joe Gossom, pilot; Lt. A. M. Gould, non-commissioned officer, and Lt. George W. Wilkins, non-commissioned officer, both of the 10th Cavalry. The two former members of the expedition had been engaged at Fairbanks and Point Barrow.

About two hours after the first plane left Fairbanks, the other two planes, one piloted by Albee Gossom, and carrying Howard Massie, radio operator, and the other carrying Gould, Capt. E. H. Bishop, and Capt. George H. Wilkins, took off for Point Barrow. The first plane would at Wainwright for the second of the two flights, while the other would start at 2 p.m. March 28. It was decided to have the ground, because of a strong radius. The two planes flew on, and are now about 25, when the radiator trouble had been remedied, the machine continued on its way to Point Barrow.

The plane carrying Captain Wilkins was downed due to engine trouble.

Captain Wilkins has announced that the expedition will remain at Point Barrow a month before returning to Fairbanks. The first sight into the Arctic, a distance of 600 miles, will be made as soon as possible. A continuation of the flight toward the Pole will be undertaken, depending upon the success of the first portion of the flight.

The Alaskan may be repaired and sent to Point Barrow later for the use of the exploration work.

Uruguay Pilot Home

Maj. Tadeo Lambarino, Uruguay air pilot, whose plane was wrecked on the Coast of Africa, during his projected flight from Italy to Montevideo, arrived at that city on April 8. He and his companion, who were captured by a Mauryan tribe and held for ransom for a short time, received an enthusiastic welcome.

Six Hours Chicago-Washington Flight

Six hours from Chicago, Ill., and Washington, D. C., were required yesterday for the round trip between the two cities, by a Leduc plane, powered with a Wright Whirlwind motor. Mr. Leduc was the pilot and Charles Dickason the passenger on the flight. At 11 a.m., the Chicago-Tellico and the Herald and Examiner were taken aboard the plane at the Aero Club Field, Chicago, and at a half past 6 p.m., Chicago time, and 4 p.m., Eastern Standard Time the Herald and Examiner was delivered at Bolling Field.

New Cheyenne-Pueblo Schedule

Effective April 20 the following air mail schedule was placed in effect on the coastwise route between Cheyenne, Wyo., and Pueblo, Colo.

Leave Cheyenne, 5:30 a.m.; leave Denver, 6:55 a.m.; leave Colorado Springs, 7:00 a.m.; arrive Pueblo, 8:30 a.m.; leave Pueblo, 4:00 p.m.; leave Colorado Springs, 4:30 p.m.; leave Denver, 6:00 p.m.; arrive Cheyenne, 7:30 p.m. Service daily.

Searchlight Flashes Pictures

It has been announced by the General Electric Co., of Schenectady, N. Y., that the electrical engineering laboratory of the company has performed a long series of searchlight tests that flashes pictures and images so clearly, buildings and smoke screens.

Projections with a dirty fish searchlight will throw a picture five miles or more feasible, the company believes. An electric fish searchlight in use can not be employed with an incandescent lamp or carbon arc.

New Inventions Before Academy

The members of the French Academy, on March 28, issued a circular calling for inventions in the field of aeronautics and meteorology. A group of Frenchmen, working through the French Society of Aviation, submitted ten plans for modifications in airplane construction, making possible nonstop flights of 5,000 miles. Details were withheld until such time as the development should be patented, but the changes are thought to include reduction in the weight of the engine and propeller, and a rearrangement of the engine and propeller. Louis Breguet, the director French airplane committee, told the members of the academy that his experiments had proved that with such reductions flights of the length mentioned could be made.

A description was also given to the members of a new invention for reducing the resistance of the wing of an airplane during flight and improving the pitch stability of wing loading.

The Trans-American Flight

The solution of pilots to surpass long-distance flights records is gradually extending the public in the fact that nonstop flights can go great distances. With this fact fully established, Mississauga in his recent Trans-American flight from Brazil to Capetown did not attempt a specimen performance, but endeavored to sketch geographical and geological knowledge through the collection of data and photographs while the flight was in progress.

Because of the lack of landing fields in unexplored countries, it is deemed most practical to use a seaplane for the flight which was to follow from north to south through Central America. A seaplane which would accommodate four people, pilot, mechanic and two men for research work, was used. The aircraft had a maximum speed of 100 m.p.h. The installation of photographic and other apparatus, as well as a dark room in which photographs could be developed. The Dornier Monoplane, which was employed for the flight, is of all-metal construction and equipped with a D.M.W. VI engine, manufactured by the Deutsche Metallwerke Miilheim. This engine develops 160 h.p. normally but with light pressure can be increased to 180 h.p. Equipped with the engine, the monoplane had a weight of 10,000 lb. which was increased since it was desired to take many high altitude photographs during the flight.

Left El Dorado, Dec. 7, 1926, left Piso, Feb. 6; left Shirley, Dec. 10; left Atbara, Feb. 14; left Akashan, Dec. 17; left Otria, Dec. 21; left Lake, Dec. 23; left Asuncion, Dec. 26; left Rio Grande, Jan. 2; left Rio Grande, Jan. 3; left Manaus (Amazon River), Jan. 4; left Rio Negro, Jan. 5; left Rio Negro, Jan. 6; left Rio Negro, Jan. 7; left Rio Negro, Jan. 8; left Rio Negro, Jan. 9; left Rio Negro, Jan. 10; left Rio Negro, Jan. 11; left Rio Negro, Jan. 12; left Rio Negro, Jan. 13; left Rio Negro, Jan. 14; left Rio Negro, Jan. 15; left Rio Negro, Jan. 16; left Rio Negro, Jan. 17; left Rio Negro, Jan. 18; left Rio Negro, Jan. 19; left Rio Negro, Jan. 20; left Rio Negro, Jan. 21; left Rio Negro, Jan. 22; left Rio Negro, Jan. 23; left Rio Negro, Jan. 24; left Rio Negro, Jan. 25; left Rio Negro, Jan. 26; left Rio Negro, Jan. 27; left Rio Negro, Jan. 28; left Rio Negro, Jan. 29; left Rio Negro, Jan. 30; left Rio Negro, Jan. 31; left Rio Negro, Jan. 32; left Rio Negro, Jan. 33; left Rio Negro, Jan. 34; 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examinations preceding within the minimum time permitted by law.

Where the regulations formerly provided for three classes of pilot license under the Commerce Department, in association with the Air Commerce Act of 1926, there are now four such classes, which are as follows: A new classification, known as Licensed Commercial Pilot. The new rating requires 50 hr. of solo flying time, plus 100 hours of actual flight time, including 50 hours of flying during the prescribed tests. This license is designed to permit the pilot to carry passengers while doing only "airline" flying, thus permitting him to build up probably the necessary time for a transport license. When the Licensed Commercial license is issued, it will limit the pilot, as far as passenger work is concerned, to a maximum of 20 miles of a given airport or location from which he can land his plane. The physical qualification for the Transport and the Licensed Commercial Pilot is identical.



The Airman Identification Card which replaces the old identification mark.

There is an exception to the theoretical examination in that the Licensed Commercial Pilot is not required to answer questions concerning the theory of aerodynamics. The practical tests for the two ratings are the same.

The requirements of the Transport Pilot are increased from 160 flying hours to a maximum, to 260 hours of solo flying. Considering that this is the highest type of license, it was found that the minimum requirement of 160 hours did not sufficiently qualify a pilot for this grade. The requirements of the Licensed Commercial license are the same.

The Licensed Pilot license has been modified to the extent that the holders are now designated as "Private Pilot" and "Student Pilot," the latter being in the nature of a special license.

Embe-Riddle Carries Radio Sets By Air

When the Crosby Radio Corporation of Cincinnati wanted to deliver some merchandise in a hurry to Columbus and Indianapolis a few weeks ago two employees were packed into one.

These pieces were furnished by the Embe-Riddle Company of Cincinnati, operating Leacock Airport, and were



Mr. Paul Riddle, left, and Averell, Chairman of the Board of Directors of the Embe-Riddle Company, stand near the equipment which was transported by air from Cincinnati, Ohio, to Indianapolis, Ind., in a record time of 12 hours, 45 minutes.

placed by Louis J. Paul Riddle and Louis Stanley Hodges, the Crosby demonstrators at Cincinnati and Indianapolis who holding "driven" meetings and they were demonstrating for new Crosby models that were just going into production. The day of the meetings arrived and they had not received their auto. They called Grammer and asked to have Paul Crosby, Jr., phone him.

Mr. Crosby immediately made an order and wheels began turning in the factory and at Leacock Airport. The last auto was extracted from the production lines after the final test and was ready by motor car to the airport, where Paulson and Riddle were taking up their places. The merchandise was loaded into the car and the two starters and the auto took off from the field in a dozen feet. Riddle started off toward Columbus and Hodges pointed his plane toward Indianapolis.

At the other end of the line the illustrations were on hand with high speed axes and when the planes landed and taxied to a stop the radio sets were transferred directly to another plane and so on until the west to the east.

Louis Hodges, flying record breaker, Captain and Colgate dealer in the throbbing and flying station.

According to T. Hughes Enderly, Pres. of The Crosby-Riddle Co., this flying expedition is one of the few to operate during all months of the year. Student training and cross-country trips occupy the bulk of the Winter business.

Mr. Enderly is particularly cognizant of the need for individual leaders in flying, and he and Industrial leaders in Paul Crosby, Jr., of the Crosby Radio Corporation, are using airplanes for that transportation.

Mayrowitz Luxor Goggles

At the beginning of the World War, Luxor goggles, designed and manufactured by F. B. Mayrowitz, Inc., were in wide use among motorists and purchasers in America. Since 1920, they had been manufactured and sold with increasing demand by the Army and Navy and by the auto-driving public. During the World War, their popularity spread to a field in which they are now of pronounced importance.

The part that the goggles played in the great struggle rated for pilots who needed every particle of protection possible. Most important was the assurance of the safety of the vision. This placed new demands upon the department of the Government which was in charge of the American forces, and in the course of action, F. B. Mayrowitz, Inc. was given a contract to manufacture 20,000 pairs of goggles for use both here and abroad.

The success of this first assignment of Luxor goggles for pilots led to the expansion. At present Luxor goggles No. 3, the Air Service model, are being used exclusively by the Postal Flying Corps and the Flying Corps. One model pilot flies over the country and against Luxor goggles No. 3 as a necessary part of their flying equipment.

Mr. F. B. Patterson Commissioned

Avalon has received from the National Cash Register Company the following notice with pleasure:

"Just before leaving Berlin, Germany, for a trip abroad, F. B. Patterson, president of the National Cash Register Company, was granted his commission as a Major in the Reserve Officers' unit of the Army aviation service. Patterson is a former president of the National Automobile Association and single from New York, Saturday, March 15, as the Bismarckia, with his family for a leisurely trip abroad among the foreign agencies of his company. He will be succeeded by William S. Orlin, vice-president of U. S. Air Service interests in Dayton, in view presenting Mr. Patterson with the commission."

Berry Bros. Lienoil Protects Metals

Lienoil, the non-petroleum, manufactured by Berry Brothers of Detroit, Mich., is an oil-cut material produced through treatment of high grade petroleum at temperatures of 1,000° F. In protecting metals, due care is taken that a painted metal part covered in part with Lienoil and exposed to dampness does not show any adhesion to the protected part when being in contact with damp ground or damp soil for a long time, whereas the part not treated with Lienoil becomes rusty.

It is especially in aviation that Lienoil has placed as outstanding service. It protects durably against the harmful influences of dampness, ice water and even of solvents. It is applied with great facility, either with a brush or by means of the dipping or spraying processes, according to the importance and possibilities of upkeep of the part to be protected. It does very easily and effectively, in the form of a wash, a day's duty of painting. Once applied, it adheres firmly, easily dries and gradually becomes harder and harder. After drying, it may receive any paint.

Albert Berrelle, also manufactured by Berry Brothers, is a high grade lacquer for express purposes and permanent. This material can be applied to fiber as well as metal and produces a glossy, durable finish that is easily cleaned and not so prone to become frosty.

This material is painted in every color, and it is expected that the future will bring Berry Brothers' manufacturing splendid shades to meet the needs of individual customers.

Acrylic Berryllite glass is applied by the spray gun method and cannot be successfully handled on account of its quick drying nature. It can be used successfully over the old glass shades that have been dried and cleaned when it is desired to clean and protect surfaces on a plane.

The material consists of the highest quality protective coating on the market. One coat of Berryllite will cost considerably less than the cost of several layers of cellulose varnish and has good coats of strength. Berryllite adds only 15-25 cents to every hundred square foot of surface.



F. B. Patterson, left, and Averell, Chairman of the Board of Directors of the Embe-Riddle Company, right, with the Luxor goggles which were transported by air from Cincinnati, Ohio, to Indianapolis, Ind., in a record time of 12 hours, 45 minutes.

Laird Makes Record Trip

On Wednesday, March 28, Charles D. Laird, Chicago, left Chicago at 8:45 p.m. in his Laird Commercial biplane with a Wright Whirlwind engine. After a smooth enough landing, the plane was at Cleveland, Ohio, at 9:45 p.m. and three hours later landed at Blackwood Field, Matthews, Tenn.

Thursday morning, March 29, the plane left Blackwood Field about 8:40 o'clock and two hours, one minute later was at Montgomery, Ala. A supply of gasoline was obtained here, the plane took off and arrived at St. Augustine, Fla., three hours later. Without landing at St. Augustine, it flew on to Hopkins, Ga., where it remained for three hours.

Mr. Laird and Mr. Ballouge remained with friends at Gaines City over Thursday, March 3, and left Gaines City during the afternoon of March 4. The trip back to Montgomery, Ala., was made in four hours against a stiff wind. They stayed at Montgomery over night, and the following day the journey to Chicago was completed. The distance between Gaines City and Chicago was 1,000 miles.

The total time from Gaines City to Chicago and return was 37 hrs. 59 mins. and the distance traveled over 2,280 mi. The longest time, from Wednesday, March 2, to Saturday, March 5, was 72 hrs.

The Laird Commercial plane is manufactured by E. M. Laird Aircraft Company, Chicago, Ill.



Three Laird Commercial biplanes with 60-hp engines. This machine is 49 ft. long with the 100-hp Wright Whirlwind.



This picture was snapped at the Wichita Airport, during the "Wichita and Friends" meet, held April 14-15. The biplane shown, an OX-5, had just completed a nonstop flight from Oklahoma City to Wichita, via Tulsa, Okla., and was en route to Denver, Colo., for the "Wichita and Friends" air meet. The machine has a 100-hp. engine.

"Now, Beech, here is why I Chose Travel Air" —

(D. C. Warren speaking). "I wanted to take over the distribution of some real airplane in the Pacific States. I wanted it to be the best ship I could find, with a high reputation, and peace family. Having satisfied myself of the way you build them by seeing them built, and having put them through every test I knew in the air; then, seeing this OX-5 job perform as it did, carrying an extra load equal to its own weight, there is only one kind for me to handle—TRAVEL AIR."

Beech bring all the required and most modern construction details to the Travel Air, and we exclusive with Travel Air, the newer models have many refinements and advantages among which are:

Greater seating capacity
Upheated cockpit
Electric starters and starters
Lack of vibration per inch
folding wings and rapid
interior and exterior

Mr. Warren is now our Pacific Coast Distributor, with headquarters in San Francisco (1809 Van Ness Ave.)

The OX-5 Travel Air carried the following load on the weight-carrying test mentioned above:

Pilot	170 pounds
Gas, 30 gallons	60 "
Sand	1090 "
1300 "	(equal to the ship's weight)

You may have our catalog by merely writing for it.

TRAVEL AIR MFG. CO., INC.
Factory and General Offices WICHITA, KANSAS

AIRPORTS AND AIRWAYS

Pittman Field, Pa.

In spite of unfavorable weather conditions, officials of Pittman Field are six weeks ahead of the corresponding period last year, and all signs point to a busy flying season. The record for March shows that a total of 275 passengers was carried during the month, although no weekend was particularly successful. The group consists mostly of local and western fliers. A total of 200 instruction flights representing fifty-six hours of instruction, given in addition of flying school activities, and several new students have lately been enrolled. The new building covering the Pittman School, an attractive little pinkish house with numerous illustrations, has been much in demand.

James D. Kirby, operations manager, made an extended flight during the week, covering the route of the New York to Atlanta air mail which Pittman Aviation will take over late this summer. During this trip he visited all principal cities on the route making a careful survey of the available landing fields and talking with city officials, the equipment of the regular landing fields for the mail planes. The designs for the new Pittman machines are now under finalization by the Pittman Aircraft Co., and their manufacture will shortly be under way.

A new member of the Pittman fleet is the new three-place plane, which bears the name of "Flowship" originally assigned to the first model Pittman transport. This machine is a very attractive model with excellent performance character-

istics, and has made a big hit with the pilots on the field. The field is now made up entirely of Pittman-built planes, having only Dressings, and there are eleven planes of every type in the field.

A recent purchase of a Pittman Crossing is G. L. Leachet, a student at Princeton University. The New York and Jersey newspapers commented upon this purchase as receiving a possible answer to the bus has an underground automobile at the University, but on this winter year correspondence has no positive information. However, if university ownership of buses becomes a reality, the cost of operation of surface problems will be removed which may prove even a necessary facility.

Linton, N. D.

By F. E. Irvin

The NorthWestern Aircraft Co. is incorporating under the laws of North Dakota and is fitting on the distribution of the New York State for the state. They expect to have a number of stations on the field in a few days.

Several stations are being established throughout the state through their duly drawn under the banner of grand Am. Aviation, who is duly expected to return from Chicago where he has been spending the winter.

We have noticed many shipments of airplane parts going and coming from the depot, the newest loads are shipping and the model of "Slope" is in the air, all signifying Spring.

STATE OF NORTH DAKOTA	
APPROVED TYPE CERTIFICATE	
Model No.	4-4, 2000cc.
Approved Type Certificate	
This certifies that <u>John A. Schaeffer</u> , 2000cc.	
is entitled to the license granted by law to the production of airplanes in quantities of at least authority of type, structure, materials, assembly and performance with the unobstructed qualities, clear plates and documents on file in the office of the Secretary of Commerce, application of which are unobstructed license and mode of purchase.	
The type of engine for which this certificate is issued is known	
Model	4-4, 2000cc.
Date	March 27, 1927.
All unobstructed plates bear the word of "Approved" and the signature of the Commissioner.	
<i>H. P. Dechanty</i>	
DEPARTMENT OF COMMERCE UNITED STATES GOVERNMENT	

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NEPTUNE
Amphibian Flying Boat**



WE are now manufacturing the Sperry and Ireland models, a biplane and a flying boat. Orders will be given priority according to date of their receipt.

The line is designed according to Department of Commerce specifications. The writer is pleased to point out that it is however many times more powerful and has better flying qualities.

Price without motor, radiator, propeller and landing gear is \$4000.00.

For further particulars, address

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Garden City, Long Island**

NEW EQUIPMENT for STANDARDS
Immediate Delivery

New Production Wings, divided with piano wire or gold colors, \$10.00; Lesters, \$10.00. Special Price Complete \$10.00.

New Seal Type Balanced Rudder, with wood fin, \$10.00. New Steel Type Rudder, \$10.00.

40 Gallon Center Section Tank, enclosed in plywood case with bulkhead fore and aft and covered with loose top to prevent fire moisture, including all gaskets connections and eight long bolts, \$15.00. Total weight 40 lbs.

New Type Low Gear, complete sets for DH-1 which weighs 99.00 D.H. Which weighs 100.00.

Aluminum Rudder for DH-1 which, per set, \$15.00.

Steel Tail Skid for Standard, \$10.00.

Our new type sand Adriatico Gondolas for Standards, including all fittings ready to install, per set, \$20.00.

Steel Landing skid with rubber, \$25.00, per pair.

Exhaust pipe with exhaust at front of motor, extra long, \$10.00.

Seal Type Radiator, standard and LS-5, \$10.00, each, \$20.00.

Steel Wing Struts per pair, \$10.00.

Hammer propeller, specially designed for Standards, 150 H.P., Hispano motor \$110.00, for 180 H.P., Hispano motor, \$120.00.

We have everything in stock for a Standard Plane or Hispano motor. **WRITE US YOUR WANTS**

**LINCOLN STANDARD AIRCRAFT CO.
LINCOLN, NEBRASKA**

window was given over to aviation with a large display of Standard Aviair photos loaned by Art Bureau of New England, Inc., Boston! Thorold sales agents, and toy aircraft models located by the Minnesota Institute of Technology.

The decision to annoy passengers comes as the result of several requests made by the big transients. Police are being used to monitor the air mail schedule, Collier having had the small plane shot down at El Paso, Texas.

Colonel E. C. who has been in Boston, started the Boston Airport Corporation and served as its president until taken ill last spring, has completely recovered after a winter in the south and returned to Boston recently to become active again. Raymond Baldwin, who was made president of the corporation some time ago, will continue president for a year at least but Brown is expected to take a hand in the operation. The Boston Airport Corporation, though organized and having instruction will be devolved itself immediately with the proceeds for the year of Boston. Art Bureau of New England Inc., have been made general sales agents for his corporation, which operates 10 fleet of Trans Air planes.

Flying around Boston last week by groups totalling Commercial engineers, lawyers, Standard Flying Club men and one-half dozen National Legion engineers, Navy seven hours, Army twenty-three and one-half hours.

Spokane, Washington

By E. H. Correll

J. B. Carroll, Seattle pilot, has taken the Govt agency for Spokane, having signed contracts with Stark & Morris, distributor for Washington, Idaho, Montana and British Columbia. Pilot Carroll came to Spokane recently, took delivery of his new plane and accompanied by Pilot Morris and Mrs. Carroll flew it over the Cascades to the mining camp of St. Joe, Idaho, 21 miles from the first camp. There he met and had dinner over the Cascades with three passengers. Carroll has made plans for the sale of ten planes in Spokane in a post office.

Since taking the Spokane agency the Spokane Pilot Morris has sold seven planes and established agencies in two districts in Montana, and in Idaho, one in Western Washington, and has joined the United Empire Agency.

Maurice Wasmund and Carl Schaefer have taken sub-agencies for Spokane.

Lieutenant Godley G. Kelly, trans-continental pilot, recently paid a visit to the 318th Aero Observation Squadron, National Guard, to put them through his A. P. test. One who got the commercial airplane rating goes two years to self-navigation, will keep his lead in with the godley.

Lieut. Oliver Gottlieb of Rockwell Field, San Jose, spoke recently with a Douglas O-2 to inspect the O-2 and Rockwell operated by Lieut. John Hayes, army instructor attached to the group. He made inspection inspection of the aircraft. Jas. Theodore Kamm, private Spokane from Rockwell Field, Spokane, Wash., went through the flight guard test, and said he would be sent through formation, mark, stunts, and the full routine of ground work.

Radiotele, water, electric lights, telephone service, machine shop and laundry, with room for parking of an automobile inside when the place is in use, are installed in a new three-plane hangar constructed by Mr. T. L. Lester, 1000 feet off of Rockwell Field for private planes. All rooms are double decked and there are numerous business rooms across the Rockwell Field, owned by the City of Spokane and leased by the National Guard.

Majority of Pilots Qualify Physically

Statistics reveal the physical qualifications of airplane pilots here are better than for any other group in the country. According to recent figures, 90 per cent of the pilots applying to the Civil Service Commission for licenses have been found physically qualified for the class to which they applied and only five per cent of them required waivers. One per cent were physically qualified for a lower class and only one per cent was physically disbarred.

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JAMES E. MALLETT & SON
TORRINGTON, CONNECTICUT

PUBLISHER'S NEWS LETTER

The subject of aircraft safety and accidents is one that usually appears in newspapers in a form that irritates even the most hardened aviation enthusiast. Big display headlines with harrowing death counts as an expression with the public that all flying is hazardous. It is therefore refreshing to read an editorial in a newspaper that is not only informative but indicates that the writer knows his subject, understands the various problems of the situation and wishes to stimulate flying instead of scaring it. The New York Times printed such an editorial on April 9 and it is reprinted as an example of the kind of writing that should be encouraged—temperate, well thought out—and constructive. It follows:

“Commander de Pseudo and his companion had perished in the flames that consumed the Santa Maria on the Roosevelt Dune, when a boy threw a lighted match into the oil-soaked waste about the cockpit; there would have been a great shattering of boards over the path impossible from explosion. If it true there is a lesson in how swift destruction, but the disaster was of a kind that never seems to have occurred before. An isolated instance of what may happen when an airplane is not in motion, too much importance should not be given to it in considering the risks of flying.

* * *

In the military air service of all countries fatal accidents make desirably reading. In Texas in 1935, four men were killed at Corpus Christi in a collision of two planes. Later in the month two officers of the Pan-American flight corp were lost their lives in a collision while landing in Buenos Aires. Almost every month Army and Navy fliers are killed in the performance of duty.

* * *

In England dastard members of the Royal Air Force were killed and downed were injured between Jan. 1 and March 16. The percentage of fatal accidents is so high in England that Mr. Baldwin was called upon recently to explain in the House of Commons. He said that “the proportion of accidents that are due to sensible causes

is a very small percentage of the whole.” The next time, he learned after a personal investigation, is “incredible to the personal equation.” The new planes were improvements on the old, but were very much faster, requiring greater deficiency of handling. The risks of flying had, therefore, become greater in the military service. By comparison civil aviation was safer. Mr. Baldwin said:

“Stunts are not made in the air because they are smart. They are made because they are safe—the only way in which the pilot can escape from the wrong when he makes handle aircraft.” That is the work for which the man has been trained, and in the course of it he has to undergo a training of such character that risk is at an absolute, even when the stated case is taken. The pilots do not only as of the ground simply—they have to go off in groups. They have to go off as many as a dozen together, wing tip to wing tip. That is necessary because in going up in light battle aircraft it is essential that members of each plane should be together and keep together from the start.

* * *

Mr. Baldwin had issued that the majority of accidents happened in the Royal Air Force in the first year or two of flying. Experience brings confidence and caution. Nowhere in the air arms have been advertising more than during the years of World War II. The general of British forces during the war was the Canadian, Gen. Sir Alexander, who, although methodical in his operations, was strictly fearless.

* * *

The banks of civil aviation must not be judged by the facilities among Army fliers. There are United States Army aviators who have flown thousands of miles without an accident. They regard endurance flights and even speed trials as not really dangerous. They believe that the three-metered “skip” with plenty of air room is safer than an automobile. Commercial flying with the latest and best machines and a return at the wheel is probably safer for the traveler than the first military trains were in the early part of the nineteenth century. Last year Eastern D. Gardner, a competent authority, flew 21,000 miles in Europe, Asia and Africa without a mishap of any kind.



What Do You Know About Airplanes?

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Complete flying and ground courses. Special speeds and distances—Swallow Aeroplane for home built aircraft.

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ALLISON AIRPLANE CO. 15000 Miles Flying Instruction. Special rates 1000 miles and more. Complete and expert training at minimum cost. Come to our airport for flying instruction, advanced practice and radio course. Come up to our airport for flying instruction, advanced practice and radio course.

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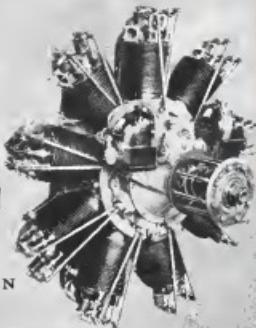
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